The Mesoscale Model Evaluation Testbed (MMET): Assisting with the transition of promising NWP techniques from research to operations

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A wide range of science innovations are under development in the research community that have the potential to positively impact operational numerical weather prediction (NWP) systems. The Developmental Testbed Center (DTC) helps facilitate the transition of available techniques from research to operations (R2O); however, with the extensive number of new capabilities available in the research community, it is critical to clearly define a testing protocol in order to streamline the R2O process. The DTC has defined such a process that relies on shared responsibilities of the researchers, the DTC and operational centers to test promising new mesoscale modeling code at three different stages. Briefly, the first stage of testing is conducted by researchers on high-impact or field program case studies. The DTC provides a common framework for researchers to demonstrate the merits of new developments through its Mesoscale Model Evaluation Testbed (MMET), which provides initialization and observation data sets for several case studies and week-long extended periods that can be used by the entire NWP community for testing and evaluation at this initial stage. The DTC has utilized the MMET data sets to provide baseline results to the NWP community for select operational configurations. If improved forecast accuracy is shown during the first stage of testing using reasonable compute resources, the innovation may be recommended to continue on to the second stage of testing. The second stage of testing is conducted by the DTC or a member of the research community through support of the DTC Visitor Program and is more extensive in nature, potentially including data assimilation cycling depending on the target application. Along with publicizing the extensive test results to the user community, information produced during this stage is shared with interested operational entities. The ultimate decision to proceed to the third or pre-implementation testing phase is made by the operational centers and is based on a variety of factors, including forecast performance and computational resource requirements.

The NWP community is encouraged to engage in the initial stage of this testing process for mesoscale modeling code that is believed to be ready for extensive DTC testing and evaluation in an operationally similar environment. This presentation will describe the components of this collaborative process, including results contributed from community members utilizing MMET datasets.